

Decision 16-12-047 December 15, 2016

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking into Policies
to Promote a Partnership Framework
between Energy Investor Owned Utilities
and the Water Sector to Promote
Water-Energy Nexus Programs.

Rulemaking 13-12-011
(Filed December 19, 2013)

**DECISION UPDATING THE WATER ENERGY NEXUS COST CALCULATOR,
PROPOSING FURTHER INQUIRY, AND NEXT STEPS**

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DECISION UPDATING THE WATER ENERGY NEXUS COST CALCULATOR, PROPOSING FURTHER INQUIRY, AND NEXT STEPS

Summary

In Rulemaking (R.) 13-12-011, the Commission granted the Petition for Rulemaking filed by the Office of Ratepayer Advocates requesting that the Commission investigate how to better develop partnerships between investor-owned electric utilities and the water sector, both public and private, to target the energy intensive requirements of the water industry to supply, convey, treat, and distribute water.¹

On January 17, 2014, Governor Brown declared a Drought State of Emergency, commenting that “the magnitude of the severe drought conditions presents threats beyond the control of the services, personnel, equipment and facilities of any single local government.”² The Commission, with its broad jurisdiction over energy, water, and other investor-owned utilities, sought to investigate the immediate-term, mid-term, and long-term actions that could be taken to combat the drought and future climate challenges.³

In the preliminary scoping memo of this proceeding, we planned to develop the Water Energy Nexus Embedded Energy Cost Calculator (Calculator). We hoped that the Calculator would enable deeper collaboration between investor-owned energy utilities and water utilities to develop energy efficiency projects and programs to target the water system as well as cost share

¹ Assigned Commissioner’s Preliminary Scoping Memo, July 1, 2014, at 2.
<http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=96688955>.

² Assigned Commissioner’s Preliminary Scoping Memo, July 1, 2014, at 1.
See <http://gov.ca.gov/news.php?id=18368> (visited March 21, 2014).

³ Assigned Commissioner’s Preliminary Scoping Memo, July 1, 2014, at 2.

energy efficiency portfolio projects.⁴ This investigation resulted in a first-in-the-nation energy efficiency and cost sharing tool.

On September 4, 2014, in Resolution ALJ-301, the Commission ratified changing the categorization of the proceeding from ratesetting to quasi-legislative. We determined that the Water Energy Nexus proceeding should look into a variety of potential policy proposals in the area of the water-energy nexus.⁵ After the Water Energy Team of the Climate Action Team (WET CAT) publicly vetted the Amended Scoping Memo, we published it in April of 2015.⁶

In 2015, the Commission unanimously adopted, in Decision (D.) 15-09-023, the Water Energy Nexus Cost Calculator tool designed to calculate the embedded energy in water and the avoided capacity cost associated with water savings.⁷ Incorporating this tool within the energy efficiency discipline is ongoing, including updates. In the Water Energy Nexus Cost Calculator 2.0 track of this proceeding, Energy Division staff is working with collaborating utilities on this effort. In this Decision we advance our work to integrate the Water Energy Nexus Cost Calculator tool with the E3 Energy Efficiency Calculator, we calculate the greenhouse gas (GHG) emissions savings resulting

⁴ Assigned Commissioner's Preliminary Scoping Memo, July 1, 2014, at 2.

⁵ Resolution ALJ-301, Ratification of changes to preliminary determinations pursuant to Rule 7.5 and categorization for Rulemaking 13-12-011, September 4, 2014.

⁶ Order Instituting Rulemaking into Policies to Promote a Partnership Framework between Energy Investor Owned Utilities and the Water Sector to Promote Water-Energy Nexus Programs, December 19, 2013. Amended Scoping Memo, April 27, 2015.

⁷ D.15-09-023, Regarding Tools for Calculating the Embedded Energy in Water and an Avoided Capacity Cost Associated with Water Savings, September 17, 2015.
<http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=154551293>

from the reduced energy used to move water through the water system, and we integrate the embedded natural gas in the water sector into the Calculator.

The Water Energy Nexus Proceeding is the first of its kind in the United States. The Water Energy Nexus Cost Calculator was the first investigation into how to enable the water and energy utilities to collaborate more closely on Energy Efficiency. During the development of the Calculator, the impact of the drought resulted in a State of Emergency.⁸ Information gathered in this proceeding's workshops and California's deepening drought underscored the need to examine several issues such as the Water-Energy-Telecommunications Nexus, to realize the potential of our Water Energy Nexus work.⁹

We began drafting the Amended Scoping Memo for this proceeding in 2014.¹⁰ Early in 2015, Commissioner Sandoval brought the Draft Amended Scoping Memo to the WET CAT meeting to gather input from our sister agencies, and from the private and government sector participants in the WET CAT.¹¹

⁸ Assigned Commissioner's Preliminary Scoping Memo, July 1, 2014, at 1. <http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=96688955>; See <http://gov.ca.gov/news.php?id=18368> (visited March 21, 2014).

⁹ Assigned Commissioner's Ruling Entering Workshop Reports into the Record and Seeking Comments, Oct. 5, 2016, Attachment A & B. (*Two workshops investigating the Water Energy Nexus and the Drought and the Water Energy Telecommunications Nexus, on August 13, 2014, and September 10, 2014 offered insight to show that the issues involved in the Water Energy Nexus were broad, complex, and required further inquiry and analysis. These workshops are available online in video format and outlines of these workshops can be found in the Assigned Commissioner's Ruling published October 5, 2016.*)

¹⁰ Public Utilities Code 1701.1(b): Pursuant to Rule 7.3(a) of the CPUC Rules of Practice and Procedure, a Commissioner issues a scoping memo for a proceeding to determine a schedule and the issues to be addressed. In a proceeding initiated by an applicant, the scoping memo determines the categorization of the proceeding.

¹¹ WET CAT is a monthly, interagency working group that meets to discuss innovative Water Energy Nexus policies. Commissioner Sandoval and State Water Resources Control Board (SWRCB) Vice-Chair Fran Spivy Weber have been the co-leads of WET CAT the past 2 years.

(footnote continued on next page)

With input from the WET CAT and the parties to this proceeding, Commissioner Sandoval published the Amended Scoping Memo for the Water Energy Nexus proceeding.¹²

Our Water-Energy Nexus proceeding work addresses and crosses many of the Commission's policy priorities. At our October 27, 2016 voting meeting, the Executive Director publicly introduced the "Legislative Umbrellas" found on the CPUC website.¹³ The policy umbrella visualization tool helps to track where and how legislative goals and tasks are being implemented across the spectrum of ongoing work performed at the Commission.¹⁴ This proceeding nestles under 5 of the 6 legislative umbrellas. The Water Energy Nexus Proceeding tracks key elements of the intent and focus of this Commission and the legislature to meet Governor Brown's ambitious policy goals for the State of California.¹⁵

The Water Energy Nexus Proceeding highlights the Commission's Core Values of Stewardship, Excellence, and Accountability. The Commission serves as responsible caretakers of the natural resources of California and designs and

The working group discusses the Water Energy Nexus policy world and all possible potential outcomes in the water energy nexus. The CPUC, the California Energy Commission (CEC), the California Air Resources Board (ARB), the SWRCB, the California Department of Water Resources (DWR), CalEPA, the California Department of Natural Resources, the California Department of Food and Agriculture (CDFA), CalRecycle, and other agencies attend regularly. Also, third parties and outside stakeholders interested in Water Energy nexus policies attend every other month including. These parties include water companies, public water utilities, irrigation districts, wastewater groups like the California Association of Sanitation Agencies (CASA), agricultural groups, desalination groups – this is a world that extends beyond just energy and just water to further discussions about that intersection point between the two silos. There are active participants at WET CAT from different divisions at the CPUC and at every other agency in the state.

¹² Amended Scoping Memo, April 27, 2015.

¹³ http://www.adminmonitor.com/ca/cpuc/voting_meeting/20161027/ @ 1:42:40.

¹⁴ http://www.cpuc.ca.gov/Proceedings_Umbrella/.

¹⁵ http://www.cpuc.ca.gov/Proceedings_Umbrella/.

implements policies that promote California's environmental sustainability. The Commission continually seeks to improve and welcomes challenges, it works with initiative and creativity across programs and divisions, like water, energy, and telecommunications, to achieve agency objectives. The Commission meets its commitments by engaging the necessary resources and working collaboratively with other groups.

The Water Energy Nexus Proceeding implicates and exemplifies the Commission's adopted Strategic Directives for Safety, Reliability and Resiliency, Universal Access, Climate Change, Environmental Sustainability, and Economic Prosperity.

The Commission must continually identify, assess, and mitigate the safety risks faced by the entities the CPUC regulates. It must assure adequate supply of regulated service, adequate infrastructure to deliver it, and that the utility systems are resilient and capable of recovering from adverse events like natural disasters. The Commission promotes policies and rules that provide universal service for energy and water and facilitate the expansion of equitable access to both. The Commission considers the impact of its decisions and policies on a wide range of Californians as well as on California's natural resources and communities. The Commission considers the economic impact of decisions and policies on California's disadvantaged communities and low-income individuals and promotes greenhouse gas reductions through its decisions and leadership for the benefit of California residents, the ecosystem, climate and the economy.

To continue this important multi-utility cross-sectional investigation, this proceeding remains open.

1. Water Energy Nexus Embedded Energy Cost Calculator 2.0 Developments

It takes energy to produce, deliver, and dispose of potable water. It can take energy to push or pull the water from the place where nature produces it to the place where it is needed. It often takes energy to move the water to storage or to deliver it to a customer. It takes energy to clean the water after it becomes waste and before it can be released to the greater environment. And if it takes energy to use water, then it must save energy if one can avoid using it.¹⁶

Now we can quantify the embedded energy in water. In D.14-09-023, the Commission unanimously adopted a new tool, the Calculator, to quantify the benefits of water-saving programs. Prior energy efficiency tools measured only the direct energy savings associated with reduced water use in site-specific energy savings programs directed at customers. The new Calculator allows for the quantification of energy savings from water conservation projects and programs targeting the water system as well as how to allocate costs and benefits among program administrators.¹⁷ The Calculator assesses water-energy program cost effectiveness for energy efficiency portfolios.

A low-flow showerhead, for instance, decreases hot-water consumption, and so decreases the need for gas or electricity to heat the hot water and to pump, transport, and dispose of cold water. A high-efficiency cooling tower uses less water per unit of cooling, and so uses less energy to pump water through the cooling system, than a less-efficient tower. The E3 Energy Efficiency Cost Effectiveness Calculator captures those site savings when evaluating a

¹⁶ D.15-09-023, September 17, 2015.

¹⁷ D.15-09-023, September 17, 2015.

site-specific program's cost-effectiveness.¹⁸ Until we developed the new Calculator, the Commission could not quantify programs or projects targeting the energy required in the water system above and beyond the energy used in a sight-specific program. Through the Water Energy Nexus Calculator, now we can.

California continues to suffer through a severe multi-year drought. In 2016, Governor Brown issued Executive Order B-37-16 directing California to, prioritize and take concrete, measurable actions that "Make Conservation a California Way of Life" and "Manage and Prepare for Dry Periods" in order to improve use of water in our state.¹⁹ The California Energy Commission and Department of Water Resources have solicited and developed more programs targeting the water-energy nexus, not only to conserve water and energy but also to reduce GHG emissions.²⁰

The Calculator has been available to energy efficiency program and project designers for over a year. UC Davis' Energy Efficiency Center utilized the Calculator in a study to preliminarily show that Governor Brown's Executive Order mandating water conservation resulted in significant energy savings across the water sector.²¹ These significant energy savings translated to reduced GHG emissions.²²

¹⁸ D.15-09-023, September 17, 2015.

¹⁹ Executive Order B-37-16.

²⁰ <http://www.energy.ca.gov/contracts/epic.html#GFO-15-323>;
http://www.energy.ca.gov/contracts/notices/2016-05-03_RFC_Benefiting_IAW_Sectors.pdf;
http://www.energy.ca.gov/contracts/notices/2016-05-03_Attachment_A_GFO-15-XXX.pdf.

²¹ <https://cwee.shinyapps.io/greengov/>.

²² <http://eec.ucdavis.edu/highlight/director-frank-loge-spotlights-new-uc-davis-study-from-center-for-water-energy-efficiency-in-la-times-article>.

Investor-owned energy utilities partnered with water utilities across multiple meetings with sister agencies, comments and replies. They collaborated to improve the Calculator, and to develop and improve water-energy targeted energy efficiency programs for the water sector. A year's worth of work following the publication of the Water-Energy Nexus Calculator gives us insight into the augmentations needed to help the utilities further integrate the Calculator. In this Decision the Commission adopts next steps to develop the Calculator, and to put it to work.

1.1. Comments on Calculator 2.0 Developments

We created the Calculator to calculate the embedded energy in energy efficiency projects targeting water conservation and the avoided capacity cost associated with water savings.²³ On February 16, 2016, an Administrative Law Judge's Ruling requested comments on proposed work to expand water-energy avoided cost tools. Parties were instructed to make comments and suggestions to update the Calculator for version 2.0.²⁴ The intent was to gather input from parties about how to make the Calculator more usable and valuable.

The Association of California Water Agencies and the California Municipal Utilities Association both noted the water sector's active role in responsible energy resource stewardship, especially in light of the state's effort to reduce GHG emissions.²⁵

²³ D.15-09-023, September 17, 2015.

²⁴ Administrative Law Judge Ruling, Feb. 16, 2016, at 7.

²⁵ Comments on Administrative Law Judge's Ruling Regarding Comments on Changes to the Water Energy Avoided Cost Tools, Association of California Water Agencies, California Municipal Utilities Association, March 1, 2016, at 2.

On October 7, 2015, Governor Brown signed Senate Bill (SB) 350. That bill requires 50 percent of California's energy portfolio to come from renewable sources by 2030. The San Diego County Water Authority commented that, in order to comply with SB 350 the ability to calculate GHG emissions reductions became of primary importance. Therefore, to increase the value of the tool, integrating GHG emissions reductions savings would help the Water Authority utilize the tool for climate action planning and future program development.²⁶

Southern California Edison (SCE) requests that the Calculator 2.0 format outputs or export outputs to allow easy integration of the Calculator's results with the existing Commission cost-effectiveness tool used for mainstream energy efficiency measures.²⁷ SCE requests that the resource balance year be updated to align with Commission policy. SCE requested a geographic information system (GIS) overlay with the Investor-owned Utilities (IOU) service territory and hydrologic regions to better target customers and potential partnerships.²⁸

Pacific Gas and Electric Company (PG&E) also discusses enabling GIS to help the electric utility identify customers and partnerships.²⁹ PG&E proposes collaborating with the other utilities to compile more comprehensive GIS database encompassing areal maps, utility boundaries, hydrologic zones, and areas of water shortage and subsidence to strengthen the integration of

²⁶ Opening Comments on Section 1.2 Water-Energy Avoided Cost Tools, March 1, 2016, at 3.

²⁷ SCE Response to Administrative Law Judge's Ruling Regarding Comments on Changes to the Water Energy Avoided Cost Tools, March 1, 2016, at 3.

²⁸ SCE Response to Administrative Law Judge's Ruling Regarding Comments on Changes to the Water Energy Avoided Cost Tools, March 1, 2016, at 3.

²⁹ PG&E Response to Administrative Law Judge's Ruling Regarding Comments on Changes to the Water Energy Avoided Cost Tools, March 1, 2016, at 3.

water-energy utility programs and statewide initiatives.³⁰ PG&E further requests that the calculator better integrate with the E3 Cost Effectiveness Calculator used in mainstream energy efficiency programs.³¹ PG&E requests the addition of default gas energy-intensity values to the W-E Calculator to create a more robust tool as well.³²

Southern California Gas Company (SoCalGas) and San Diego Gas and Electric Company (SDG&E) both note that the barrier to moving forward on water energy nexus energy efficiency programs involves the process to claim embedded energy savings that will be acceptable to the Commission's Energy Division through the Ex Ante Review Team and the Database for Energy Efficient Resources ("DEER") team.³³ By establishing approved input values and the process to submit work papers that included embedded energy savings to the Commission, the utilities will be able to fully utilize the water energy nexus calculator.³⁴ Both SoCalGas and SDG&E agree that inclusion of gas default values should have high priority in the Calculator 2.0 development to allow for future gas and water company partnerships.³⁵

³⁰ PG&E Response to Administrative Law Judge's Ruling Regarding Comments on Changes to the Water Energy Avoided Cost Tools, March 1, 2016, at 3.

³¹ PG&E, Response to Administrative Law Judge's Ruling Regarding Comments on Changes to the Water Energy Avoided Cost Tools, March 1, 2016, at 4.

³² PG&E, Response to Administrative Law Judge's Ruling Regarding Comments on Changes to the Water Energy Avoided Cost Tools, March 1, 2016, at 4.

³³ Joint Response to Administrative Law Judge's Ruling Requesting Comments on Water-Energy Avoided Cost Tools, March 1, 2016, at 2.

³⁴ Joint Response to Administrative Law Judge's Ruling Requesting Comments on Water-Energy Avoided Cost Tools, March 1, 2016, at 2.

³⁵ Joint Response to Administrative Law Judge's Ruling Requesting Comments on Water-Energy Avoided Cost Tools, March 1, 2016, at 3.

Irvine Ranch Water District (IRWD), in working with SCE, determined that the tool provides an estimate and a value of the embedded energy savings, but it is unclear how a utility can claim the embedded energy savings from such a water-energy partnership project. IRWD suggests that the Commission give some consideration to how the Tool relates and applies to utility energy program savings targets.³⁶

The Office of Ratepayer Advocates (ORA) suggested multiple updates to the tool including updating the resource balance year to represent a more realistic timeframe for the need and availability of the default marginal supply, new recycled water services, since they take time to permit, build, and bring online.³⁷

Commissioner Sandoval asked further questions about incorporating the default value for embedded natural gas in water.³⁸

Metropolitan Water District, citing a 2005 study about the 2001 California water system, wrote that while natural gas is not a significant part of urban water conveyance, treatment, and distribution, it is used directly by various end uses, such as heating water. Natural gas is also embedded in the electricity that retail electric utilities provide to urban water agencies from power plants that are fueled by natural gas. As the amount of renewable energy in the electric utilities energy portfolio increases, the amount of natural gas embedded in electricity will

³⁶ Irvine Ranch Water District Comments on Administrative Law Judge's Ruling Requesting Comments on Water-Energy Avoided Cost Tools, March 1, 2016, at 3-4.

³⁷ ORA, Comments on Water Energy Tool Updates, March 1, 2016, at 2.

³⁸ Assigned Commissioner's Ruling, August 3, 2016.

decrease. These uses are not currently captured by the Water-Energy Cost Calculator.³⁹

SoCalGas commissioned a study to recommend a value representing natural gas to the Commission by the end of 2016, because understanding the embedded natural gas in the water system will make it easier to establish a water-energy nexus program.⁴⁰

Through use of the calculator and further work, PG&E reconsidered its preliminary recommendation about incorporating gas in the calculator to instead focus on the significant energy source, electricity.⁴¹ PG&E updated its recommendations to request that the CPUC operationalize the calculator by standardizing the process of calculating, reporting, reviewing, and tracking water savings and embedded energy savings for both Deemed and Custom projects as helpful updates to the databases, upload templates, and the overall process.⁴² The Commission appreciates PG&E's comments based on experience-based analysis and agrees with its standardization suggestions, although we determine that the cost calculator should reflect natural gas use as that is a primary input for electricity.

We turn to the next step of updating the Calculator based on the input received over the course of the past year of calculator use and learning.

³⁹ Metropolitan Water District of Southern California's Comments on ACR to Support Integration of the Embedded Cost of Natural Gas into the Water-Energy Cost Calculator, August 22, 2016, at 4.

⁴⁰ SoCalGas, SDG&E, Comments on ACR to Support Integration of the Embedded Cost of Natural Gas into the Water-Energy Cost Calculator, April 22, 2016, at 3-4.

⁴¹ PG&E, Comments on ACR to Support Integration of Embedded Cost of Natural Gas, April 23, 2016, at 2.

⁴² PG&E, Comments on ACR to Support Integration of Embedded Cost of Natural Gas, April 23, 2016, at 4.

1.2. Next Steps in Calculator 2.0 Developments

The water energy nexus cost embedded energy cost calculator originally was developed for use in energy efficiency portfolio and project development. The calculations required for the tool stemmed from the needs of and experience with energy efficiency programs. Through collaboration between the parties and lessons learned from the first year of using and operationalizing the new tool, 3 distinct areas for development emerged.

First, the Calculator must be fully integrated with the E3 Energy Efficiency Cost Calculator used in standard energy efficiency program development as well as the DEER. Simplifying the interaction between the Calculator and the E3 Energy Efficiency Cost Calculator will help the Commission and utilities move forward on the implementation of water-energy efficiency programs and projects. The integration process will be done in such a way so that double counting does not occur.

Second, sister agencies are considering and in some cases developing water-energy projects and programs to target GHG emissions reductions. In order to quantify GHG emissions reductions from projects developed using the Calculator, the energy saved in kWhs must be translated into GHG savings. This separate calculation should be incorporated more clearly into the Calculator to showcase the GHG savings resulting from energy saved from water-energy nexus energy efficiency projects and programs. It is possible today to calculate GHG savings associated with energy saved as indicated by the calculator, but doing so now requires a two-step process with the second step using the E3 calculator.

Finally, with SoCalGas' embedded gas study results due at the end of 2016, those results should be used to update the Calculator to include the

embedded gas component. It is appropriate to allow 6 months after the completion of the study for the embedded natural gas component to be integrated into the calculator.

Energy Division, in coordination with the Investor Owned Utilities and using Energy Division's Evaluation, Measurement and Verification ("EM&V") funding, will take the steps necessary to update the tool through. A Plan of Action will be jointly filed and served on this proceeding within 45 days of the adoption of this decision. The Plan of Action can include convening a working group, working with a consultant, or other requirements to produce the calculator inputs.

2. Investigate Data Transportation and Communications for Optimized Energy and Water Management

The Amended Scoping Memo in the Water Energy Nexus proceeding was issued on April 27, 2015 after much investigation into issues connecting water and energy in relation to the dramatic changes felt in both sectors as a result of the drought and Governor Brown's Executive Order B-29-15.⁴³

The amended scope determined that the proceeding will examine what near-term, mid-term, and long-term actions the Commission could take to address the water-energy nexus in water conveyance, delivery, and use for water storage... water recharge ... water delivery, and other areas including enabling demand response and time shifting, actions to address the water-energy nexus in energy production, transmission, distribution, and use, design, deployment, and utilization of onsite micro grids, construction and design of energy generation, storage and management facilities, implementation of demand response,

⁴³ Amended Scoping Memo, April 27, 2015, Section 2.1, issue 3.

ancillary services, grid services, advanced market-based clean energy mechanism, requires making telecommunications facilities and services that comply with grid management standards available for Distributed Energy Resources (DER) visibility and control.

The Water-Energy-Communications Nexus track of the Water Energy Nexus proceeding examines the nexus of water, energy, and communications (*e.g.*, the use of information management and data systems, high-speed internet access, social media and apps, and Supervisory Control and Data Acquisition (SCADA) systems), for energy facility management, DER integration, water system management, water treatment, and the communications needs in SCADA and other systems, and steps to foster access to energy and communications technologies, and facilities that enable electricity system and water system management, water storage, treatment, and use, including for wildfire and other public safety measures, in a manner that addresses the water energy nexus.⁴⁴

Furthermore, it evaluates access to electric, gas, storage, renewable energy, and other power infrastructure as an enabling technology to address the water-energy nexus, including the link between power access and communications facilities. It evaluates broadband internet access for the managers and users of water storage, treatment, conveyance, recharge, and recycling facilities. And it considers steps to promote such access.⁴⁵

A principal goal of this proceeding is to promote the intersection of water management and conservation, and energy management and conservation.

⁴⁴ Amended Scoping Memo, April 27, 2015, Section 2.1, issue 7, bullet 1.

⁴⁵ Amended Scoping Memo, April 27, 2015, Section 2.1, issue 7, bullet 2.

Connecting these two important concepts requires intensive data analysis. Infrastructure and services to provide both voice and internet communications for data management, transportation, and analysis, including narrowband and broadband signals, are critical to water and energy management, the use of resources, and public safety. Communications infrastructure and services are critical to transporting operational data generated at a source facility. That data must travel to the analysis site where decisions are made to enable control and the realization of market value associated with generation or conservation.

Telecommunications service enables the collection and transmission of data to facilitate energy, DER, and water facility and service action and analysis. By “telecommunications service,” we mean all possible physical configurations of telecommunications services that provide access to voice, narrowband internet, broadband internet, and data signals, regardless of the technology.⁴⁶ To create any type of market tool to incentivize water and energy optimization and management, the data transportation pathway must be standardized and secured.

Access to reliable communications is increasingly critical to optimize water and energy facility operations and management as our state works to forestall climate change, mitigate or adapt to climate change, and to reduce GHG emissions associated with the electric, natural gas, and water sectors.⁴⁷ This proceeding’s analysis of the water energy telecommunications nexus showcased the critical role of telecommunications in the optimization and management of water and energy. California Public Utilities Code Section 451 commands us to

⁴⁶ Assigned Commissioners Ruling, Oct 26, 2016, at 4.

⁴⁷ Assigned Commissioners Ruling, Oct 26, 2016, at 4.

ensure water and energy service that is safe and reliable, at just and reasonable rates. That helps achieve our goals of protecting the public and environment.⁴⁸ Telecommunications service is critical to doing so now, and will be even more critical in the future.

The water-energy-telecommunications nexus merits further discussion as electric utilities request billions of ratepayer dollars for system upgrades. The Commission must develop guiding principles to create the data transportation channels that enable water and energy facilities and services to be controlled and optimized through a future smart grid. Communications platforms will also serve as the platform for market mechanisms to manage grid operations at digital speeds.

2.1. Investor Owned Electric Utilities & CAISO can help to Optimize Water and Energy use with Communications

At this proceeding's Water-Energy-Telecommunications nexus workshop, the IOU panel discussed how DER facilities larger than 1 MW in size must communicate 3 data points with the utility every 4 seconds: voltage, real power, and reactive power. Facilities larger than 9.9 MWs must communicate every 4 seconds the three data points above, as well as the following statuses: plant on, plant off, and circuit breaker status. Data can be transported to the utility over various media that today range from plain old telephone lines to Voice Over Internet Protocol or cellular services.⁴⁹

There is concern that many DER assets connected to the distribution grid sized at 99 MW, aggregated together, do not currently communicate with the

⁴⁸ Assigned Commissioners Ruling, Oct 26, 2016, at 4-5.

⁴⁹ Assigned Commissioners Ruling, Oct. 26, 2016, at 6.

utility or California Independent System Operator (CAISO) at all, which masks generation and load. In grid fault situations, facilities trip off, but load remains. As the grid comes back online, there may be large power swings to consider and manage for the safety of communities and the grid. Today that management is largely done by controls on the electric grid, rather than through communications signals. Enabling communications that provide visibility would offer much-needed information about load conditions. Communications-based controls would reduce risks and costs associated with such events.⁵⁰

Today, when communications go down at an electric facility, depending on the type of communications channel, either a person is dispatched to determine the utility plant status, the plant has 7 days to fix the communications failure, or the plant is taken offline. Size and materiality of the facility are two factors taken into consideration when communications from a facility to a utility go down. This is particularly true when communications may be down but electricity may still be flowing. Gaining visibility, in person if needed, and control, through grid protections from faults if not through communications, is critical to maintaining electric safety.⁵¹

The utility “wire chief” interacts with telecommunications companies to report electric facility communications service issues. There is an escalation process for chronic communications service failures, though the time to repair some repeated failures on communications lines varies. To date, electric utilities have not reported these failures to the Commission.⁵² Utilities currently

⁵⁰ Assigned Commissioners Ruling, Oct 26, 2016, at 8.

⁵¹ Assigned Commissioners Ruling, Oct 26, 2016, at 7.

⁵² Assigned Commissioners Ruling, Oct 26, 2016, at 7.

purchase many communications services through federal or state tariffs. Several utility representatives discussed concern about the impact of telecommunications service or facility retirements on the management and operation of their systems. These concerns escalate when a substitute communications service is not being offered in that location, the new service presents additional technical issues or has not been confirmed to meet electric grid or DER operational standards, the new communications service increases costs, or there is no known replacement method.

At the September 20, 2016 workshop, electric utilities discussed the difference between current grid safety and protection practices from the future grid safety and protection schemes that may come into being as smart inverters participate as grid assets. The difference between the current grid and the future grid with smart inverters used for hyper local grid protection is an infusion of communications.

The type of data that would be required by a utility may change if the utility were to use an energy facility or DER more dynamically. A microgrid, for example, requires real time load and supply data to be continually processed by computers. High speed communications availability is a prerequisite for microgrid deployment, operations, and management.⁵³ For a large utility, communications will enable the increased dynamic visibility and control of facilities. Rather than a microgrid-style centralized computer processing grid information, the dynamic energy facility and DER future will more likely look like a *distributed federated hierarchical system of control*. Communications

⁵³ Assigned Commissioners Ruling, Oct. 26, 2016, at. 7.

availability, speed, and latency issues proliferate in considering how to make this future system come into being.⁵⁴

CAISO and the IOUs discussed company communications work-arounds used to increase ease and speed of new facility interconnection. As telecommunication services retire they sometimes create service gaps, and often increase costs of communications services across the energy utility space.⁵⁵

CAISO requires direct telemetry to each resource participating in its market, accessible by connecting to the CAISO Energy Management System (EMS). CAISO first invented the remote intelligence gateway (RIG) connection and, at the workshop, introduced its new Dispersive Communications Platform as an option for new resources to connect to CAISO's Energy Communications Network (ECN) to participate in the Energy Management System (EMS).⁵⁶

2.2. Agriculture, Water Utilities, Electric Vehicles, with Communications, could assist in the Water and Energy Optimization Process

California Department of Food and Agriculture's State Water Efficiency and Enhancement Program (SWEEP) uses technology to promote water and energy savings in the agricultural sector, the largest water using sector in the state. To optimize water and energy use and imbue the agricultural sector with technology, data access, communications, and analysis is required. Optimized water pumping, irrigation technology, automated systems switching on and off, soil moisture sensors, and other technology advances in the agricultural sector,

⁵⁴ Assigned Commissioners Ruling, Oct. 26, 2016, at 7-8.

⁵⁵ Assigned Commissioners Ruling, Oct. 5, 2015, Appendix G, Comments of the Edison Electric Institute filing in Federal Communications Commission docket on Technology Transitions.

⁵⁶ Assigned Commissioners Ruling, Oct. 26, 2016, at 8;
See, <http://www.caiso.com/rules/Pages/BusinessPracticeManuals/Default.aspx>.

all require data communications and broadband. CDFA fields lots of complaints that there is no broadband in California fields and many agricultural sites, especially in the Central Valley of California where many specialty crops for the United States are grown.⁵⁷

California Water Service (Cal Water), the largest water utility in California and the third largest in the United States, requires various communications services to analyze data on energy-consuming water pump efficiencies, water and energy consumption, water treatment, and water pressurizing functions, throughout the state and the country. For example: somewhere between 5 and 8 percent of the water in their system is lost, and gets booked as “non-revenue water.” More data developed through more widespread advanced metering infrastructure will help the utility to determine where that water gets lost. Cal Water cautioned parties to consider the forced obsolescence of communications technology as the telecommunications industry modernizes in less than 10-year cycles, often in 2 or 5-year cycles at the longest. This is much quicker than meter technology modernization, pump modernization, or other legacy facilities that rely on communications to continue functioning and can last from 10-50 years. The communications technology cycle is often out of sync with the General Rate Case (GRC) cycle, raising financial, reliability, and regulatory issues between GRCs.⁵⁸

Cal Water currently manages over a billion data points a day and Metropolitan Water District manages even more.⁵⁹ Automated Metering

⁵⁷ Assigned Commissioners Ruling, Oct. 26, 2016, at 8.

⁵⁸ Assigned Commissioners Ruling, Oct. 26, 2016, at 9.

⁵⁹ Assigned Commissioners Ruling, Oct. 26, 2016, Attachment A, at 15.

Infrastructure (AMI) installation will add to the data management needs of the utility. There is a tremendous amount of data moving from energy and water systems, and more data will be generated in the future, needing communications channels to transmit information, visibility, and control messages. The bottom line is that a new system cannot operate on a long-term basis without communications.⁶⁰

Electric vehicles (EVs) will help conserve water in the state by reducing reliance on the water and energy intensive processes to produce and refine oil. EVs can help to manage the grid if proper signals are communicated about grid conditions. This data management requires widely-deployed, reliable, and affordable communications services. EV data development will be needed for grid management purposes, commercial purposes, taxation purposes, monitoring purposes, and to charge as payment is collected.⁶¹

Several DER facilities developers suggested that the Commission investigate some type of energy-oriented data communications services tariff that provides the equivalent of a low cost data channel for systems that meet certain qualifications. For example, an unlimited data requirement at a given speed at a low, flat cost, would benefit the grid, society, and the communications service provider. Access to communications facilities and services is currently a higher barrier for DER developers. DER cannot become grid-connected, be monitored or controlled, or serve as a transactive asset without communications facilities to reliably transmit two-way high speed data.⁶²

⁶⁰ Assigned Commissioners Ruling, Oct. 26, 2016, at 8.

⁶¹ Assigned Commissioners Ruling, Oct. 26, 2016, at 9-10.

⁶² Transactive energy refers to the economic and control techniques used to manage the flow or exchange of energy within an existing electric power system in regards to economic and market

(footnote continued on next page)

The U.S. Department of Energy wrote a report in 2007 discussing building communications facilities and service for utilities,⁶³ and this proceeding has reinvigorated and created a forum for that conversation in 2016. Several speakers recommended that the Commission consider the role of communications for transmission grid protection and communication techniques for application to the distribution grid. Many utility engineers currently act to keep the lights on with little help from communications-connected DERs.⁶⁴

The time has come where communications must be a ubiquitous asset, rather than a barrier to the clean energy distribution grid of the future. Integrated communications will allow sensing, measurement, advanced controls, improved integrated interface design, and a market platform for energy service. Without modern communication and distributed applications, no advanced smart grid, let alone a transactive grid, will emerge.

While visibility and control may have different requirements for DER communications with the utility or CAISO, market participation has requirements at the CAISO transmission level and is non-existent at the distribution level. At the transmission level, telemetry occurs every 4 seconds and is distinct from the billing system. At the distribution system, there needs to be a cost effective method of facilitating this step. If we anticipate that DER billing and control/ management are separate technical functions, they can be

based standard values of energy. *Atamturk, Nilgun (October 2014). ["Transactive Energy: A Surreal Vision or a Necessary and Feasible Solution to Grid Problems?"](#)*

⁶³ Modern Grid a Systems View, Appendix B1, "Integrated Communications," Conducted by the National Energy Technology Laboratory for the United States Department of Energy, Office of Electricity Delivery and Energy Reliability, February 2007.

⁶⁴ Assigned Commissioners Ruling, Oct. 26, 2016, at 10.

dealt with differently. For market development to occur at the distribution level, the communications requirements for market participation will need to be known and standardized.⁶⁵

On September 27, 2016, a discussion draft of a Distribute Energy Resources Action Plan (Action Plan) was published on President Picker's website.⁶⁶ The draft Action Plan was publicly presented at the September 29, 2016 Commission voting Meeting.⁶⁷

Through the implementation of D.16-06-052, the unanimous decision updating Electric Tariff Rule 21 interconnection rules and incorporating Phase 2 and Phase 3 of the Smart Inverter Working Group, these communications requirements questions for distributed energy resources become ripe.⁶⁸

Through further consideration of Electric Vehicle standards and Vehicle to Grid operations and potential, questions about communications requirements for distributed energy resources becomes apparent.

The topic of data transportation, communications services access, and communications expenditures by utilities to modernize the grid requires more analysis which we enable through this Decision.

2.3. Comments on the Water Energy Telecommunications Nexus

The Association of California Water Agencies represents 430 public water agencies delivering water to 90 percent of the residential, agricultural, and industrial users in the state. The California Municipal Utilities Association

⁶⁵ Assigned Commissioners Ruling, Oct. 26, 2016, at 11.

⁶⁶ <http://cpuc.ca.gov/picker/>.

⁶⁷ http://www.adminmonitor.com/ca/cpuc/voting_meeting/20160929/ @ 1:31:35.

⁶⁸ D.16-06-052.

comprises publically-owned electric and water agencies delivering service to over 70 percent of California. Together, these entities noted that many of their members have successfully incorporated renewable energy facilities into their operations to reduce GHG emissions while maintaining water deliveries.⁶⁹ Their members wrote that they have increased energy recovery in conveyance and distribution systems, installed solar generation systems, developed other renewable energy projects, performed energy studies, and audited facility energy usage.⁷⁰

The California Water Association requested that the Commission investigate adopting rules concerning the confidentiality of water customer AMI data. Such rules would be commensurate with the privacy protections afforded to electric and gas customers and would be consistent with the Commission's efforts to ensure the protection of customer confidentiality and usage information.⁷¹ The Utility Reform Network (TURN) agrees that the Commission ought to consider data privacy and security questions for water customers.⁷²

⁶⁹ Association of California Water Agencies, California Municipal Utilities Association, Comments on Administrative Law Judge's Ruling Regarding Comments on Changes to the Water Energy Avoided Cost Tools, March 1, 2016, at 2-3.

⁷⁰ Association of California Water Agencies, California Municipal Utilities Association, Comments on Administrative Law Judge's Ruling Regarding Comments on Changes to the Water Energy Avoided Cost Tools, March 1, 2016, at 2.

⁷¹ California Water Association, Comments on Administrative Law Judge's Ruling Regarding Changes to Water-Energy Avoided Cost Tools and Advanced Meter Infrastructure Proposals, March 4, 2016, at 4.

⁷² TURN, Reply Comments of the Utility Reform Network on the Utilities Advanced Meter Infrastructure Pilots, at 6.

The ORA and the San Diego Water Authority both agree that water data security requires greater consideration.⁷³ TURN recommends that the data sharing requirements and protocols established in D.14-05-016 be applied to water utilities when sharing water usage data. In addition to data sharing requirements, the Commission should also consider data security issues, especially the increased risk of security threats resulting from data being transmitted between water utilities and IOUs.⁷⁴

TURN states that some issues in the Water-Energy-Telecommunications Nexus scope require technical staff not necessarily assigned to the Water Energy Nexus Proceeding, though the ruling does raise significant safety and communications questions.⁷⁵ TURN agrees with the Association of California Water Agencies and the California Municipal Utilities Association that some of these questions require their own proceeding so that challenges and opportunities can be more fully explored.⁷⁶ Consumer Federation of California suggests the Commission look to the energy data storage proceedings for methods and policies relating to how, with whom, and at what granular level energy-water data should be shared.⁷⁷

⁷³ ORA, Reply Comments on ACR Entering Workshops into the Record and Seeking Comments, Oct. 31, 2016, p5; San Diego Water Authority, Reply Comments on ACR Entering Workshops into the Record and Seeking Comments, Oct. 31, 2016, Section C.

⁷⁴ TURN, Reply Comments on ACR Entering Workshops into the Record and Seeking Comments, Oct. 31, 2016, at 5.

⁷⁵ TURN, Reply Comments on ACR Entering Workshops into the Record and Seeking Comments, Oct. 31, 2016, at 2.

⁷⁶ TURN, Reply Comments on ACR Entering Workshops into the Record and Seeking Comments, Oct. 31, 2016, at 3.

⁷⁷ Consumer Federation of California on the Assigned Commissioner's Ruling, Oct. 26, 2016, at 2.

New DER deployments across the state will require communications facilities to detail operations to DER managers, aggregators, utilities and CAISO, to enable water and energy management and optimization. Increasing access to communications facilities and services is a foundational enabler of the smart grid and of the creation of markets

The IOUs indicate that this topic should be considered in the Distribution Resource Planning Proceeding,⁷⁸ the Integrated Distributed Energy Resources Proceeding,⁷⁹ or through the implementation of D.16-06-052, the unanimous decision updating Electric Tariff Rule 21 interconnection rules and incorporating Phase 2 and Phase 3 of the Smart Inverter Working Group.⁸⁰

SDG&E indicated that the recent Assigned Commissioner's Ruling on Track 3 Issues in the Distribution Resource Planning proceeding might be the place to further investigate the communications requirements for grid modernization. In that ruling, Commissioner Picker indicated that Track 3 Sub-track 2 will include:

- Identification of distribution grid technologies and/or functions that enable greater DER penetration, integration and value maximization (versus investments that promote visibility, reliability, or resiliency generally);
- Which technologies may be needed on a location-specific basis (whether due to natural adoption or as needed to enable a distribution investment deferral) and which may be needed system-wide; and

⁷⁸ R.14-08-013, DRP.

⁷⁹ R.14-10-003, IDER.

⁸⁰ SDG&E, Reply Comments to Assigned Commissioner's Ruling from October 5, 2016, October 31, 2016, at 2-3.

- The type of information a utility must provide in order to justify the necessity or cost-effectiveness of a proposed DER-related grid modernization investment.⁸¹

SDG&E proposes that in Track 3 Sub-section 2 of the Distribution Resource Planning proceeding, the Commission will examine specific technologies that the IOUs may need to manage and accommodate DERs throughout their systems and whether to establish guidelines to govern utilities' proposed grid modernization investments in the future.⁸² SDG&E noted that Track 3 Sub-section 2 will identify the types and functions of technologies, including those related to communications that will enable greater DER penetration on the electrical distribution grid.⁸³

SCE and PG&E both submitted comments in support of further exploration of the role of telecommunications in grid integration.⁸⁴

2.4. Next Steps Include Asking More Questions

We agree with SDG&E that this topic of data transportation, data transportation access, and principles under which to evaluate communications-related expenditures by investor-owned electric utilities falls within R.14-08-013 Track 3 Sub-track 2: Grid Modernization Investment Guidance. That sub-track is focused on identifying the types and functions of technologies, including those related to communications, that will enable greater DER penetration on the

⁸¹ R.14-08-013 Distribution Resources Plan Assigned Commissioners Ruling on Track 3 Issues, at 6.

⁸² R.14-08-013 Distribution Resources Plan Assigned Commissioners Ruling on Track 3 Issues, at 6.

⁸³ SDG&E, Reply Comments to Assigned Commissioner's Ruling from October 5, 2016, October 31, 2016, at 2.

⁸⁴ PG&E, Reply Comments to Assigned Commissioner's Ruling from October 26, 2016, at 2-4; SCE, Reply Comments to Assigned Commissioner's Ruling from October 26, 2016, at 2.

electrical distribution grid. We refer this topic for inclusion in R.14-08-013 Track 3 Sub-track 2 through the appropriate process. We agree with SCE and PG&E that this topic should fall under the Distributed Energy Resources Action Plan.

3. Watershed Management for Greenhouse Gas Emissions Reduction, Optimized Water and Energy Resources, Utility Infrastructure Protection

Improved management of California's forested watersheds provides multiple benefits, including water-quality improvement, increased water yield from the watershed, and improved habitat for fish and wildlife. The benefits of improved forest management in the water realm can be complemented by benefits in the energy realm through deep reservoirs for enhanced operations at hydroelectric systems, and by the use of the residuals of the management operations for renewable energy production.⁸⁵

By making the forested watersheds healthier and more fire resilient, not only is the flow of water through the watershed protected, but the quality of the water is also protected reducing energy needs to clean it. Wildfires greatly increase rates of sedimentation and can carry contaminants of various kinds, reducing water-storage capacity in downstream reservoirs. Watershed management may also provide benefits outside of the water arena, such as using the residuals as renewable biomass fuel for power production, improved air quality and public health, improved habitat for fish and wildlife, and increased employment opportunities in rural areas where unemployment is often high.⁸⁶

⁸⁵ Green Power Institute, Comments on the AC's Ruling Seeking Comments, at 2.

⁸⁶ Green Power Institute, Comments on the AC's Ruling Seeking Comments, at 2.

During disasters, temporary cellphone and internet communications are set up through a Cell on Wheels (COW) or a Cell on light Truck (COLT). These communications links can take a week to 12 days or longer to establish communications because the communications backhaul to carry the signal from the COW or COLT to the communications network has to be built or arranged. Erecting a new cell tower would be fruitless without the backhaul to connect it to the network. All cell towers are connected by wires to the communication wire network, or trunk, where all communications data flows. Only when the cell tower or a COW or COLT is connected to the main communication wire network, or communications backbone, will the call, data, and internet connection be established. Voice communication is critical among first responders, communities, and during and after emergencies. Internet communication, maps, and video can be used to coordinate with first responders, fire teams including utilities, to protect people, property, infrastructure, watershed, and communities. These data points are helpful immediately but only become part of the responders' toolkit after functional communications are established by connecting the emergency cell tower, COLT, or COW, to the backhaul, or main telecommunications network.⁸⁷ In a disaster, every moment is precious in coordinating safety responses.

Examination of the Water-Energy-Telecommunications Nexus began in 2014, spurred by the urgency of addressing the drought and communications for energy management, including public safety and fire risk management. The October 31, 2015 workshop in this proceeding held with utilities, water companies, and CAISO at the California Office of Emergency Services (CalOES) highlighted the evolving communications needs of utilities as they increasingly

⁸⁷ Assigned Commissioner's Ruling, Oct. 19, 2016, Attachment A, at 6.

faced large-scale wildfires and changing demands for their water and energy services.⁸⁸ At the workshop, water, energy and telecommunications utilities, parties, and state officials discussed their individual and collective responses to wildfires and disasters, in coordination with CalOES and disaster preparedness plans.⁸⁹ Analysis of the Water-Energy-Telecommunications Nexus showcased the vulnerability of current utility infrastructure to fire damage and the communications systems. During many disasters such as large-scale wildfire, many communications channels go down and can no longer be used to coordinate evacuation or emergency response.

At the workshop, San Diego Gas and Electric presented its weather sensor system used to detect weather patterns, optimize and protect the distribution grid from weather patterns from clouds to wild fire.⁹⁰ The weather sensor network transmits data over various transportation channels including mesh, microwave, satellite, private spectrum, WiFi, telecommunications company business level communications services, and plain old telephone service, among others.⁹¹

At the September 2016 workshop we learned about the challenges the San Francisco Public Utilities Commission (SFPUC) faced to continue water and electricity service to its Greater Bay Area customers during the Rim Fire disaster in and around the Hetch Hetchy Reservoir, located in Tuolumne County, in 2013.⁹² SFPUC, through the Hetch Hetchy Reservoir, provides drinking water

⁸⁸ Assigned Commissioner's Ruling, October 5, 2016, at 8.

⁸⁹ Assigned Commissioner's Ruling, October 5, 2016, at 8.

⁹⁰ Assigned Commissioner's Ruling, October 5, 2016, Attachment D, at 2.

⁹¹ Assigned Commissioner's Ruling, October 5, 2016, Attachment D, at 2.

⁹² Assigned Commissioner's Ruling, Oct. 19, 2016, at 2.

for most of the Bay Area. Like many remote areas, the Hetch Hetchy area lacked access to communications facilities and services during the Rim Fire disaster, putting water and energy facilities, public safety, and property at risk. The means of communications that the SFPUC relied upon “up country” near Hetch Hetchy were completely wiped out: no cell phone service and no e-mail from inside the fire zone was feasible.

But the SFPUC persevered.⁹³ SFPUC relied heavily on the pay phone located in the fire zone at Camp Mather in Moccasin, California for communications until the emergency communications backhaul was installed.⁹⁴ SFPUC established a “quarter brigade” to drive rolls of quarters from banks in San Francisco and around the state to ensure that workers, residents, first responders, and anyone who needed to make a call during the Rim Fire could use that one working payphone. This example illustrates the challenges experienced by other fire-stricken communities and the utilities that provide service to those communities.

Courtney Aviation, a contractor to the US Forest Service, described how enabling a downlink of movable fire maps from an aerial tactical unit, a firefighting airplane, to ground control and disaster management permitted quick, decisive action to be taken to combat wildfire, protect utility infrastructure, and protect public safety and property.⁹⁵ Courtney Aviation deploys a portable mesh network to create the communications backbone infrastructure to downlink the data from the plane to ground control for

⁹³ Assigned Commissioner’s Ruling, Oct. 19, 2016, at 6.

⁹⁴ Assigned Commissioner’s Ruling, Oct. 19, 2016, Attachment A, at 4.

⁹⁵ Assigned Commissioner’s Ruling, Oct. 19, 2016, at 6.

decision-making purposes. As the only aerial tactical unit incorporating military-style communications technology into firefighting, this best practice can be replicated.⁹⁶

Courtney Aviation's microwave downlink uses a mesh network to enable the information from the air to be transported/ linked to the command staff on the fire to see what's happening at real time. Digital data needs to be moved at a high rate of speed to enable this process to occur. Multiple In Multiple Out (MIMO) technology provides multiple rapid pathways at Ethernet speeds (around 50 Megabits). The network moves data around in a network of transmitting boxes, transmitters and repeaters.⁹⁷ Courtney Aviation can set up its system and break it down at will.

At the Middletown and San Francisco workshops, Supervisor Edson of Calaveras County detailed the responses that emergency personnel took during the Butte Fire, costing over \$127 million dollars, when all of the telecommunications and power utility infrastructure burned.⁹⁸ He described the complications that arise in watershed management and the state's waterways in the post-forest fire reality including toxic debris flow into Mokelumne Watershed requiring energy to treat, and reduced reservoir depth reducing hydroelectric output.⁹⁹ Calaveras County, along with other forested, resource-rich counties, is

⁹⁶ Assigned Commissioner's Ruling, Oct. 19, 2016, Attachment A, at 4.

⁹⁷ Assigned Commissioner's Ruling, Oct. 19, 2016, Attachment A, at 7, Attachment C, at 5-6.

⁹⁸ <http://www.sierranevada.ca.gov/our-work/mokelumne-watershed-analysis>

⁹⁹ Assigned Commissioner's Ruling, Oct. 5, 2016, Attachment F, "Chocolate Water."

investigating possibilities for better watershed management to promote resource security and resiliency for the state.¹⁰⁰

Since Calaveras County watershed feeds into the San Joaquin Basin, where water for growing vegetables comes from, Supervisor Edson described the teaching of Dr. Roger Bales, Founding Professor of Engineering at UC Merced regarding tree distance management to help maximize water yield from the watershed. Proper forestry management, for example, slows down the movement of water and promotes the return of meadows. Properly managed forests, water basins, flood control basins, increase habitat and aquifer recharge for larger water yield.¹⁰¹ Education and property management could also increase water yield and value.¹⁰² Telecommunications facilities and services are critical for energy generation visibility, optimization and management, and grid management, and can lead to grid and energy system savings and GHG reduction.¹⁰³ Likewise, communications facilities and services are crucial for water facility and service management, monitoring, and control. Infrastructure in existence today, and the new smart grid components of tomorrow, requires care, vigilance, and protection, and requires attention to the communications platforms which will enable or hinder the development of new means of distributing or transacting water and energy services.

Utilities currently spend time and money protecting their workers, communities, and facilities in the face of disaster, then rebuild burned

¹⁰⁰ Assigned Commissioner's Ruling, Oct. 19, 2016, at 7.

¹⁰¹ Assigned Commissioner's Ruling, Oct. 5, 2016, Attachment F, at 2.

¹⁰² Assigned Commissioner's Ruling, Oct. 5, 2016, Attachment F, at 2.

¹⁰³ Assigned Commissioner's Ruling, Oct. 5, 2016, at 8.

equipment. This results in hundreds of millions of dollars in expenses booked to memorandum accounts, like the Catastrophic Events Memorandum Account (CEMA).¹⁰⁴ The utilities then apply to the Commission to recover these costs from their ratepayers. A pinch of prevention is less expensive than a pound of cure. With the price tag of burned facilities associated with wildfires in the hundreds of millions for one electric utility alone, investing in technologies and services that can aid in firefighting and shorten the length and intensity of fires is a prudent investment for utility facilities now and in the future.

3.1. Comments on Watershed Management

AT&T requests that the Commission not “attempt to use some of the serious issues facing California (*e.g.*, drought and forest fires) as justifications... and extend the Commission’s jurisdiction over communications services...”¹⁰⁵ The ability of communities to manage and cope with the serious issues facing California, like drought and forest fire, is enabled or compromised by the availability of robust and reliable communications facilities and services.¹⁰⁶

The Consumer Federation of California agrees that farmers with more advanced communications infrastructure could use various technologies to promote better agricultural management during a drought, and that first responders can better control fires, protect water quality, the watershed, and existing infrastructure. Substantial upgrades in infrastructure “could benefit both the water and energy ratepayer through more reliable service, lower overall

¹⁰⁴ When a utility incurs substantial, exogenous costs, it may book those costs to a memorandum account, subject to adjustment under the eight “Z factors”. D.89-10-032. The costs must have sustained as a result of a natural disaster or calamity. D.94-06-011.

¹⁰⁵ Opening Comments of AT&T California, Oct. 21, 2016, at 3-4.

¹⁰⁶ See, I.14-05-012.

costs, and enhanced stewardship of our natural resources.” Ultimately, however, these efforts to expand, add, or replace infrastructure will require research and funding.¹⁰⁷

Many watershed lands are owned or managed by electric or water utilities as part of their hydro-electric or water resources. In other cases, watershed lands are owned publicly (federal or state), by federally-recognized tribes, or privately.¹⁰⁸ The Green Power Institute believes that the energy focus of watershed-management operations in this proceeding should be expanded to include greater consideration of the residuals that are produced in the course of performing watershed-management operations, and the carbon-cycle implications of various land management options for watershed lands.¹⁰⁹

3.2. Next Steps in Watershed Management

TURN and ORA support the concept of incremental, cost effective proposals to improve watershed management for Greenhouse Gas Emissions Reduction, optimized water and energy resources, and utility infrastructure protection. PG&E supports the idea of cooperating and collaboration with partners in forestry, fire prevention, CalOES, CalFire. Others collaborators may also be appropriate.

Based on ongoing examinations into current and best practices for preparing for and managing disasters, the Commission directs electric, gas and Class A and B water utilities, with Safety and Enforcement Division and

¹⁰⁷ Consumer Federation of California on the Assigned Commissioner’s Ruling, Oct. 26, 2016, at 2.

¹⁰⁸ Green Power Institute, Comments of the Green Power Institute on the Ruling Seeking Comment on the September 29 Workshop, at 2.

¹⁰⁹ Green Power Institute, Comments of the Green Power Institute on the Ruling Seeking Comment on the September 29 Workshop, at 3.

Telecommunications Division, and other collaborators, to hold a workshop to investigate communications for use during disasters such as wildland or large-scale fires, like, for example using rapidly deployable communications technologies like MIMO systems. The workshop should be held within 120 days of the date of this Decision and should be cross-notified with the Safety Model Assessment Proceeding (A.15-05-002 et al.) and the Fire Map 2 Proceeding (R.15-05-006). This examination should focus on the opportunities to enhance the protection of worker and public safety, promote reliability.

4. Comments on Proposed Decision

The proposed decision of Assigned Commissioner Catherine Sandoval in this matter was mailed to the parties in accordance with Pub. Util. Code Section 311 and comments were allowed pursuant to Rule 14.3 of the Commission's Rules of Practice and Procedure. Opening comments were filed by December 5, 2016 by TURN, the Association of California Water Agencies & the California Municipal Utilities Association jointly, the Consumer Federation of California, California Water Association, SCE, the Green Power Institute, AT&T, Metropolitan Water District, PG&E, SoCalGas, and SDG&E and reply comments were filed on December 12, 2016 by the ORA, California Water Association, and PG&E and SDG&E jointly.

TURN strongly supports collaboration and coordination between water utilities and energy IOUs to find ways to cost effectively save water and energy simultaneously and generally supports the Proposed Decision (PD) and its exploration of important issues affecting water and energy management, public

safety and disaster planning.¹¹⁰ TURN generally supports enhancing the Water Energy Nexus Cost Calculator tool (Calculator), updating the Calculator to quantify the embedded natural gas in the water system is an important step in the right direction to enable the evaluation of EE programs that target natural gas use, and incorporation of the Calculator with the E3 EE program calculator.¹¹¹

TURN supports the PD's referral of the topic of "data transportation, data transportation access, and principles under which to evaluate communications-related expenditures by investor-owned electric utilities" to Track 3 Sub-track 2 of the Distributed Resource Planning Proceeding (R.14-08-013).¹¹² TURN requests more time before the grid integration workshop.¹¹³

On the topic of watershed management for greenhouse gas emissions reduction, optimized water and energy resources, utility infrastructure protection, TURN supports the concept that, "A pinch of prevention is less expensive than a pound of cure."¹¹⁴ TURN requests that pilot programs be designed to address gaps in current vegetation management and disaster response activities and not result in duplicative spending. TURN suggests that the proposals should indicate how the proposed activities are unique and different in GRC spending and/or Fire Safety Rulemaking and include that detail in the proposal.

¹¹⁰ TURN Comments on the PD, Dec. 5, 2016, at 6.

¹¹¹ TURN Comments on the PD, Dec. 5, 2016, at 3.

¹¹² TURN Comments on the PD, Dec. 5, 2016, at 3-4.

¹¹³ TURN Comments on the PD, Dec. 5, 2016, at 4.

¹¹⁴ TURN Comments on the PD, Dec. 5, 2016, at 4.

Association of California Water Agencies and California Municipal Utilities support the Commission's efforts to further understand the important of and find solutions to the many water and energy nexus issues facing California's water community.¹¹⁵ Public water agency members strive to implement energy efficiency savings through responsible, sound water and energy management practices and request a correction of the description of their membership.¹¹⁶

Consumer Federation of California prefers that a working group convene to enable party participation and discussion about updates to the Water Energy Nexus Energy Efficiency Cost Calculator.¹¹⁷ CFC suggests that the issues identified in the Water-Energy-Telecommunications nexus portion of the PD require more analysis and further discussion as the issue is complex.¹¹⁸

California Water Association notes that understanding the link between energy and water savings is of critical importance in California, particularly in light of the current and ongoing drought emergency.¹¹⁹ CWA favors doing analysis, with a particular focus on examining how improving communications systems will protect water company employees, customers, and system infrastructure within the scope of the water-energy-telecommunications nexus.¹²⁰ CWA notes that many facets of the Water Energy Nexus proceeding and the

¹¹⁵ Joint Opening Comments from Association of California Water Agencies & California Municipal Utilities Association, Dec. 5, 2016, at 3.

¹¹⁶ Joint Opening Comments from Association of California Water Agencies & California Municipal Utilities Association, Dec. 5, 2016, at 2.

¹¹⁷ Comments of Consumer Federation of California, Dec. 5, 2016, at 2.

¹¹⁸ Comments of Consumer Federation of California, Dec. 5, 2016, at 3.

¹¹⁹ Comments of California Water Association, Dec. 5, 2016, at 9.

¹²⁰ Comments of California Water Association, Dec. 5, 2016, at 3.

leadership embodied in the “first-in-the-nation energy efficiency and cost-sharing tool” fully comports with the CPUC’s 15 Strategic Directives adopted on June 23, 2016. The Water-Energy Nexus proceeding aligns with CPUC’s Strategic Directives including safety, reliability and resiliency, consumer protection, education and assistance, environmental sustainability, coordination with other governmental entities, and risk management. The proceeding also showcases the Commissions Core Values including Stewardship, Excellence and Accountability.¹²¹

CWA reiterates its request that the Commission consider extending its data privacy rules applied to electric utility customer data to water utility customer data with the developing roll out of the water utility Advanced Metering Infrastructure.¹²² Further, CWA requests clarification of ambiguous terms for more consistency throughout the proposed decision.¹²³

SCE recognizes the importance of moving expeditiously to implement grid modernization and has proposed aggressive grid modernization investment plans in its 2018 GRC and DRP Application.¹²⁴ SCE is pleased to see the proposed decision recognizes the importance of grid modernization technologies and the need to consider advanced communications technologies and recommends that this exploration occur in the DRP proceeding.¹²⁵ SCE notes that while communications technologies are not explicitly referred to in the DRP

¹²¹ Comments of California Water Association, Dec. 5, 2016, at 4.

¹²² Comments of California Water Association, Dec. 5, 2016, at 4-7.

¹²³ Comments of California Water Association, Dec. 5, 2016, at 5.

¹²⁴ Southern California Edison Comments on Proposed Decision, Dec. 5, 2016, at 2.

¹²⁵ Southern California Edison Comments on Proposed Decision, Dec. 5, 2016, at 2.

Ruling on Track 3 issues, SCE has always interpreted the “grid modernization” scope to include these technologies.¹²⁶

SCE comments that the existing working group is meeting monthly to utilize the Calculator in new water energy nexus energy efficiency programs and notes that the ability to calculate the amount of associated greenhouse gas emissions reductions can be determined.¹²⁷ SCE requests that the Calculator be updated to incorporate energy demand.¹²⁸

The Green Power Institute (GPI) supports speedy passage of the proposed decision as it urges the Commission to focus on issues related to watershed management.¹²⁹ Since the consequence of the prolonged drought is the massive die-off of trees in the state’s forests, GPI believes that the proposed decision provides appropriately prominent treatment for watershed management issues, including the connection to wildfires.¹³⁰

AT&T requests clarification that AT&T not be ordered to participate in investigating how to forestall CEMA account and Z factor account accrual since accounting mechanisms apply to electric utilities.¹³¹ AT&T also requests clarification of the term, “utilities.”¹³²

Metropolitan Water District (Met) has long recognized the important connection between energy and water and resubmits an outdated, pre-drought,

¹²⁶ Southern California Edison Comments on Proposed Decision, Dec. 5, 2016, at 3.

¹²⁷ Southern California Edison Comments on Proposed Decision, Dec. 5, 2016, at 3-4.

¹²⁸ Southern California Edison Comments on Proposed Decision, Dec. 5, 2016, at 4.

¹²⁹ Opening Comments of the Green Power Institute, Dec. 5, 2016, at 2.

¹³⁰ Opening Comments of the Green Power Institute, Dec. 5, 2016, at 2.

¹³¹ Comments of AT&T on Proposed Decision, Dec. 5, 2016, at 2.

¹³² Comments of AT&T on Proposed Decision, Dec. 5, 2016, at 2.

2005 study of the embedded natural gas in water from 2001 to reiterate concern that there may only be minimal embedded natural gas in water now.¹³³

PG&E cautions that updates to the water energy nexus cost calculator could result in double counting and requests that updates are done in such a way so that does not happen.¹³⁴

PG&E notes that the proposed decision correctly recognizes that energy IOUs require adequate communications infrastructure to enable the safe addition of electric supply and demand-side resources interconnected to the utility distribution grid or distributed energy resources.¹³⁵ PG&E supports continuing the identified discussion of these issues in the Distribution Resources Planning Proceeding, Track 3, Sub-track 2.¹³⁶ PG&E does not, however, recognize the need to collaborate with certain Water IOUs in those efforts.¹³⁷

PG&E does not see the use or benefit of reporting communications outages to the Commission despite noting that the PD correctly recognizes the importance of reliable telecommunications services for the safe and reliable operations of the electrical distribution system.¹³⁸

¹³³ Comments of Metropolitan Water District on Proposed Decision, Dec. 5, 2016, at 2-3.

¹³⁴ Opening Comments of Pacific Gas and Electric Company on Proposed Decision, Dec. 5, 2016, at 2-4.

¹³⁵ Opening Comments of Pacific Gas and Electric Company on Proposed Decision, Dec. 5, 2016, at 5-6.

¹³⁶ Opening Comments of Pacific Gas and Electric Company on Proposed Decision, Dec. 5, 2016, at 5.

¹³⁷ Opening Comments of Pacific Gas and Electric Company on Proposed Decision, Dec. 5, 2016, at 6.

¹³⁸ Opening Comments of Pacific Gas and Electric Company on Proposed Decision, Dec. 5, 2016, at 6-7.

PG&E believes that the legislature has provided a ratemaking mechanism to record costs incurred to overcome the results of catastrophes and therefore does not see the need to contemplate action related to CEMA account accrual.¹³⁹ PG&E comments that requiring utilities to conduct activities to forestall CEMA or Z-factor account accrual is contrary to the purpose and application of those accounts.¹⁴⁰ PG&E supports the concept of designing and implementing pilot projects for infrastructure protection once emergency response to the state drought and tree mortality emergency situation stabilizes though notes it is unrealistic to expect a pilot project be capable of completely forestalling the need for CEMA or Z-factor adjustments.¹⁴¹

PG&E appreciates the PD's search for opportunities to reduce risk to infrastructure and increase public, employee, and responder safety but doesn't think that PG&E should act unilaterally. Rather, PG&E suggests flexibility and notes that PG&E works with Cal Fire, Cal Office of Emergency Service and FEMA in increasing communications capabilities during emergencies.¹⁴²

SoCalGas comments that it prefers that ownership of the water energy nexus cost calculator remain with Energy Division.¹⁴³ SoCalGas requests that the timeframe for updating the calculator with results from the embedded natural

¹³⁹ Opening Comments of Pacific Gas and Electric Company on Proposed Decision, Dec. 5, 2016, at 6.

¹⁴⁰ Opening Comments of Pacific Gas and Electric Company on Proposed Decision, Dec. 5, 2016, at 7.

¹⁴¹ Opening Comments of Pacific Gas and Electric Company on Proposed Decision, Dec. 5, 2016, at 8.

¹⁴² Opening Comments of Pacific Gas and Electric Company on Proposed Decision, Dec. 5, 2016, at 9-10.

¹⁴³ Comments of Southern California Gas Company on Proposed Decision, Dec. 5, 2016, at 2.

gas in water study be set to 6 months after the completion of the study, the completion of which is delayed from its original December 2016 date.¹⁴⁴

SoCalGas requests clarification in the use of the term “utility” to identify when the proposed decision is indicating electric, water, or gas utilities.¹⁴⁵ Finally, SoCalGas requests success metrics and clarification for watershed management pilots.¹⁴⁶

SDG&E agrees with and supports the “next step” objectives for the water energy nexus cost calculator as identified in the propose.¹⁴⁷ SDG&E requests that funding continue to come from Energy Division’s Evaluation, Measurement and Verification (“EM&V”) funding managed by Energy Division staff, in collaboration with the four IOUs.¹⁴⁸

SDG&E believes that the discussions about grid modernization framework developing, including topics pertaining to identifying data and communications needs and how such data and communications are to be transmitted, are within the scope of the Distribution Resources Planning (DRP) proceeding (R.14-08-013) and DER Action Plan.¹⁴⁹ SDG&E also notes the Vehicle-to-Grid Proceeding and workshop d as well as the Integrated Capacity Analysis and Locational Net Benefit Analysis are additional venues where discussion of data access and transmission are ongoing.¹⁵⁰

¹⁴⁴ Comments of Southern California Gas Company on Proposed Decision, Dec. 5, 2016, at 2-3

¹⁴⁵ Comments of Southern California Gas Company on Proposed Decision, Dec. 5, 2016, at 4.

¹⁴⁶ Comments of Southern California Gas Company on Proposed Decision, Dec. 5, 2016, at 5-6.

¹⁴⁷ Comments of San Diego Gas & Electric Company on Proposed Decision, Dec. 5, 2016, at 2.

¹⁴⁸ Comments of San Diego Gas & Electric Company on Proposed Decision, Dec. 5, 2016, at 2.

¹⁴⁹ Comments of San Diego Gas & Electric Company on Proposed Decision, Dec. 5, 2016, at 3-4.

¹⁵⁰ Comments of San Diego Gas & Electric Company on Proposed Decision, Dec. 5, 2016, at 4-5.

SDG&E agrees with the PD's identification of the importance of communication services between energy facilities and utility and that unplanned communication outages may have negative impacts on electric distribution operations.¹⁵¹ SDG&E also agrees that current utility-to-CPUC reporting protocols do not include reporting on communications outages.¹⁵² SDG&E requests that prior to requiring reporting that Safety Enforcement Division and Energy Division hold a workshop to determine the reporting template.¹⁵³

SDG&E appreciates the goal articulated in the proposed decision to investigate emerging technologies to help protect infrastructure from wildfire but requests 6 months as a reasonable amount of time to complete the investigation and develop use-case requirements since one size does not fit all.¹⁵⁴ SDG&E has already begun to evaluate and document these use-cases and potential technology solutions to meet these equipment as this process began several years ago.¹⁵⁵

The Commission hereby adopts Assigned Commissioner's proposed decision.

5. Assignment of Proceeding

Commissioner Catherine J.K. Sandoval is the assigned Commissioner.

¹⁵¹ Comments of San Diego Gas & Electric Company on Proposed Decision, Dec. 5, 2016, at 6.

¹⁵² Comments of San Diego Gas & Electric Company on Proposed Decision, Dec. 5, 2016, at 6.

¹⁵³ Comments of San Diego Gas & Electric Company on Proposed Decision, Dec. 5, 2016, at 6-7.

¹⁵⁴ Comments of San Diego Gas & Electric Company on Proposed Decision, Dec. 5, 2016, at 8.

¹⁵⁵ Comments of San Diego Gas & Electric Company on Proposed Decision, Dec. 5, 2016, at 9.

Findings of Fact

1. The Water Energy Nexus Cost Calculator calculates the cost effectiveness of energy efficiency programs that target water conservation and thus the embedded energy in the water system.
2. Quantifying the embedded natural gas in the water system will enable the development of energy efficiency programs that reduce GHG emissions in the natural gas used in water systems, that conserve energy used in the water system, and that reduce the water used in the natural gas production cycle.
3. SoCalGas commissioned a study to recommend a value representing the natural gas embedded in the water system to the Commission by the end of 2016.
4. Connecting the Water-Energy Calculator with the commonly-used E3 energy efficiency program and the Database for Energy Efficient Resources will enable the efficient use of the Water-Energy Calculator for Energy Efficiency program development.
5. All energy facilities greater than 1 MW in size require telemetry to communicate operations data, either to the electric utility for some visibility, or to the CAISO to participate in the market, or both.
6. Electric utilities provide electricity to water utility customers to enable water delivery throughout the State. Water utilities require energy to operate the water system, and the drought has required water utilities to rethink their energy footprint in light of changed water supplies and service.
7. Investor-owned electric utilities experience communications services outages that impact energy resource management, sometimes requiring a resource to be turned off until communications services are restored.
8. Investor-owned electric utilities do not currently report communications services outages to the Commission.

9. Both water and energy utilities use data to manage their facilities.
10. Water, energy, and telecommunications utilities are called as responding parties to forest fire emergencies.
11. Water, energy, and telecommunications infrastructure often burns in forest fires, which impacts utility service and public safety.
12. Investor-owned energy utilities book expenses for response to declared emergencies to a Catastrophic Event Memorandum Account (CEMA). The utilities seek to recover these costs from ratepayers.
13. When a utility incurs a substantial, exogenous cost, prior to its next GRC test year, due to a natural disaster or calamity, the utility may book that cost, subject to adjustment under the eight Z factors.
14. One utility alone has booked hundreds of millions of dollars in its CEMA account for responses to wildfires and large-scale fires since 2012.
15. Energy utilities, and Class A and B water utilities, may be able to use communications technology to mitigate the effects of natural disasters.
16. Energy utilities, and Class A and B water utilities, may be able to propose watershed management programs that will mitigate the effects of natural disasters.

Conclusions of Law

1. Under Public Utilities Code Section 451, the Commission must ensure that utilities provide service that is safe and reliable, at just and reasonable rates.
2. Under Section 451, and Sections 701, 761, 762, and 768, the Commission must ensure that utilities build and maintain their systems and facilities in a manner that promotes the health and safety of their employees, customers, and the public.

3. Under D.15-09-023, the Water-Energy Calculator must quantify the energy saved by reducing water use.

4. It is reasonable to update the Water-Energy Calculator to incorporate a GHG emissions reduction output value for water-energy nexus energy efficiency measures.

5. It is reasonable to connect the Water-Energy Calculator with the commonly-used E3 energy efficiency program and the Database for Energy Efficient Resources.

6. It is reasonable to update the Water-Energy Calculator to incorporate a value representing the natural gas embedded in the water system.

7. It is reasonable to use the results of the natural gas study commissioned by Southern California Gas Co. to perform the update described in #6, above.

8. It is reasonable to require PG&E, SCE., SDG&E and SoCalGas (collectively, “the energy utilities”) to create a Plan of Action for how best to update the Water-Energy Calculator in the ways listed above.

9. It is reasonable to require the energy utilities to work with Energy Division to create the Plan of Action.

10. It is reasonable to develop principles under which the Commission may evaluate the technical requirements for grid modernization communications and data transportation expenditure requests made in electric utility GRC filings.

11. It is reasonable to require the energy utilities to develop a communications services outages template to report service outages that impact energy service, energy facilities, and/or grid management.

12. It is reasonable to require the energy utilities to report those service outages to the Commission.

13. It is reasonable to require the energy utilities, and Class A and B water utilities, to investigate how best to use communications technologies to mitigate the effects of natural disasters.

14. It is reasonable to require the energy utilities, and Class A and B water utilities, to investigate the creation of watershed management projects that will mitigate the effects of natural disasters.

ORDER

IT IS ORDERED that:

1. Within 7 days of the date of this Decision, Pacific Gas & Electric Company Southern California Edison Company, San Diego Gas & Electric Company, and Southern California Gas Company, shall begin collaborating with Energy Division to create a Plan of Action to update the Water Energy Nexus Cost Calculator.

2. The Plan of Action shall address how best to do the following:
(a) create, and incorporate into the Water-Energy Calculator, a greenhouse gas emissions reductions value for water-energy nexus energy efficiency measures;
(b) connect the Water-Energy Calculator with the commonly-used E3 energy efficiency program calculator and the Database for Energy Efficient Resources;
and, (c) within 6 months of the completion of Southern California Gas Company's natural gas study, incorporate into the Water-Energy Calculator a value representing the natural gas embedded in the water system.

3. Within 45 days of the date of this Decision, Pacific Gas & Electric Company, Southern California Edison Company, San Diego Gas and Electric Company, and Southern California Gas Company shall file and serve in this proceeding a Motion requesting Commission approval of the Plan of Action.

4. Within 6 months of Commission approval of the Plan of Action, Pacific Gas & Electric Company, Southern California Edison Company, San Diego Gas and Electric Company, and Southern California Gas Company shall update the Water-Energy Calculator in the manner approved by the Commission.

5. We refer the following topic for further investigation to R.14-08-013, the Distributed Resources Plan proceeding; or, if the issue is not scoped in that proceeding, then to a new proceeding: the development of principles under which the Commission may evaluate the technical requirements for grid modernization communications and data transportation expenditure requests made in electric utility GRC filings. Pacific Gas & Electric Company, Southern California Edison Company, San Diego Gas and Electric Company, Southern California Gas Company, and the Class A and B Water Utilities shall participate in that proceeding.

6. Within 60 days of this Decision, Pacific Gas & Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas and Electric Company (SDG&E), and Southern California Gas Company (SoCalGas) shall, under the direction of Safety and Enforcement Division, Communications Division, and Energy Division, convene a workshop to develop a communications services outages template to report service outages that impact energy service, energy facilities, and/or grid management. This workshop shall be noticed to the service list of this proceeding, and to the service lists of the Safety Model Assessment Proceeding (Application 15-05-002 et al.) and the Fire Map 2 Proceeding (Rulemaking 15-05-006). Pacific Gas & Electric Company, Southern California Edison Company, San Diego Gas and Electric Company, and Southern California Gas Company shall begin reporting such service outages to

the Directors of Energy, Telecommunications, and Safety and Enforcement Division.

7. Within 120 days of the date of this Decision, Pacific Gas & Electric Company, Southern California Edison Company, San Diego Gas and Electric Company, Southern California Gas Company and the Class A & B Water Investor Owned Utilities, with Safety and Enforcement Division and Communications Division, and other collaborators such as CalOES, CalFire, US Forest Service, and others, shall convene a workshop to investigate how best to use communications technology to, in a cost-effective manner: protect the safety of the customers they serve, their workers, and utility infrastructure; improve the watershed upon which they rely; mitigate fire danger resulting from dead trees, drought, and other conditions that negatively impact water, energy, and telecommunications infrastructure, workers, and the customers they serve, now and into the future. The workshop shall be noticed to the service list of this proceeding, and to the service lists of the Safety Model Assessment Proceeding (Application 15-05-002 et al.) and the Fire Map 2 Proceeding (Rulemaking 15-05-006).

8. Within 60 days of the date of that workshop, Pacific Gas & Electric Company, Southern California Edison Company, San Diego Gas and Electric Company, Southern California Gas Company, and the Class A and B Water utilities shall serve to the above listed service lists a workshop report addressing how best to use communications technology to mitigate natural disasters in the manner discussed at the workshop.

9. Rulemaking 13-12-011 remains open.

This order is effective today.

Dated December 15, 2016, at San Francisco, California.

MICHAEL PICKER

President

MICHEL PETER FLORIO

CATHERINE J.K. SANDOVAL

CARLA J. PETERMAN

LIANE M. RANDOLPH

Commissioners